Niagara-Falls

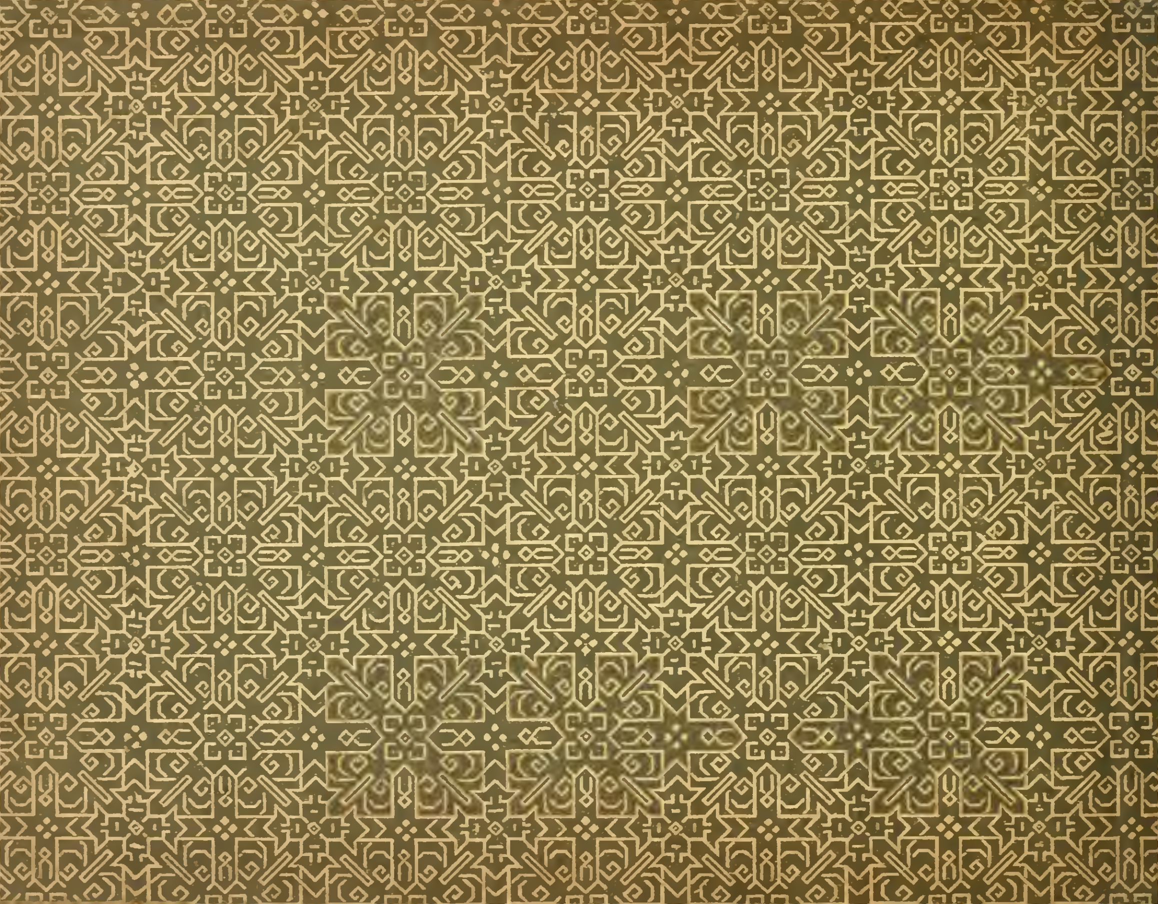


Photo-gravures of

Niagara Falls

Publisher of American Views,
250 Adams St., Brooklyn—New York.

The Albertype Co., N.Y.



Both Falls, from Prospect Point.



American Fall and Suspension Bridge, from Goat Island.



Rock of Ages and Cave of the Winds.



AMERICAN AND HORSESHOE FALLS, FROM PROSPECT POINT.



PROSPECT POINT—WINTER.



UPPER STEEL ARCH BRIDGE, FROM VICTORIA PARK.



American Fall from Canada.



Both Falls—Winter Scene.



American Fall, from Goat Island.



Both Falls.



Upper Steel Arch Bridge.



Bend of Horseshoe Fall from Goat Island.



Goat Island Bridge from Luna Island.



Horseshoe Fall.



Horseshoe Fall in Winter, from below—Canada Side.



Both Falls and Prospect Point.



Winter Scene in Prospect Park.

Ice Formation.



Horseshoe Falls—View from Canada Side.



American Rapids and Goat Island Bridge.



ICE MOUNTAIN—AMERICAN FALL.



American Fall from Goat Island—Winter.



Horseshoe Fall from Goat Island.



HORSESHOE FALL AND THREE SISTERS ISLANDS,
FROM MICHIGAN CENTRAL TRACKS.



STEAMER "MAID OF THE MIST" APPROACHING HORSESHOE FALL.



THE THREE SISTERS ISLANDS.



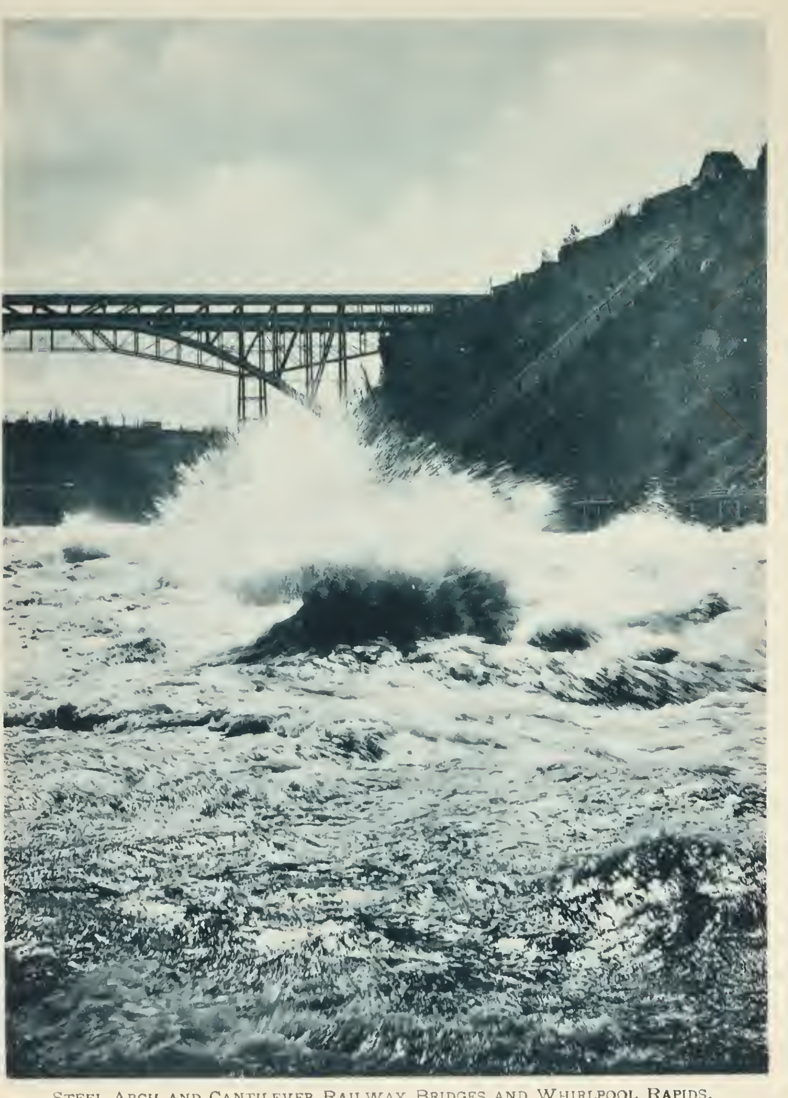
Canadian Rapids, seen from Three Sisters Islands.



SECOND BRIDGE, THREE SISTERS ISLANDS.



Town of Niagara Falls from Observatory Tower.



Steel Arch and Cantilever Railway Bridges and Whirlpool Rapids, from Buttery Elevator.



CANTILEVER AND STEEL ARCH RAILWAY BRIDGES OVER THE GORGE.



The Whirlpool and the Gorge.

THE Niagara Falls,

An Itinary for a One, Two or Three Day's Visit.

AND SURROUNDINGS





FROM BUFFALO TO TORONTO.

WITH SUPPLEMENTS: NIAGARA'S IMMENSE POWER. NIAGARA IN WINTER. GEOLOGICAL. NIAGARA RIVER. CITY OF NIAGARA FALLS. HOTELS.

... **COMPLIED BY ORRIN E. DUNLAP.**

The Albertype Co., N. Y.

One Day Guide to the Niagara Falls.

THE person who has only one day in which to see the sights about Niagara is extremely unfortunate. The entire locality teems with views that will gladden the hearts of visitors, but they cannot all be seen in one brief day. To make the best of his or her time, however, the visitor must engage a carriage and leave the hotel in the early morning and drive at once to Prospect Park. As you enter the park you are on the lands of the State Reservation, and as there is no admittance fee, you can admire the merits of free Niagara. The act of the Legislature that created the State Reservation was passed on April 30th, 1883, and the grounds were thrown "open and free of access to all mankind, without fee, charge or expense to any person for entering upon or passing to or over any part thereof" on July 15th, 1885. The Reservation includes Goat Island, Bath Island, the Three Sister Islands, Luna Island, Chapin Island and the small islands adjacent to said islands in the Niagara River, and also certain portions of the river bed, together with a string of land beginning with Port Day, and running along the shore to and including Prospect Park and the cliff and slope. The area comprises 107 acres and the cost to the State was $1,433,429.50.

PROSPECT PARK.

Prospect Park, your first stopping place, contains about 12 acres. It has a frontage on the gorge and also on the river previous to its plunge over the American Fall. The park is the "picnic ground" of the reservation. It is open until 11 P. M. during the summer. Alighting from your carriage in front of the Inclined Railway building, walk along the stone parapet wall to Prospect Point and there enjoy a full view of the American and Horseshoe Falls.

THE AMERICAN FALL.

Standing on Prospect Point the water dashes past you, and you watch it fall on the rocks below. The American Fall is all that part of the cataract between Goat Island and Prospect Point. It is 1,000 feet across, and the rapids above it have a descent of 40 feet in a half a mile. The height of the fall is 159 feet. This will be found an interesting point to linger at, but you must not tarry too long, as time is precious. Walk back to Hennepin View, where a good general view is to be had. Then enter the Inclined Railway Building, and take the cars to the foot of the slope. The charge is 10 cents. The stairs are free. When you get out of the car,

turn and pass out the door to your left and walk along the path toward the foot of the fall. From this point you will get a magnificent view of the falling water and its mighty force as it strikes the rocks. Now go and board the staunch and pretty little steamer "Maid of the Mist", at its dock, which is in plain sight. The charge is 50 cents for each passenger, and the tickets will allow you to land on the Canadian side and return on any trip of the boat the same day. The view of both falls to be had from the steamer's deck during her trip is one of the finest obtainable at Niagara. Passing in front of both sheets of water you invade the realms of fairyland and all about are beautiful rainbows. Do not leave the steamer until it reaches the dock from which you started. Then ascend the incline, take your carriage and order the driver to Goat Island.

While crossing the first bridge your attention will be attracted by the beauty of the scene. The water as it apparently "comes from the clouds" far up stream and dashes over the many ledges is most fascinating. The little islands to your left are called Brig Island and Ship Island; to your right are Chapin Island, Robinson Island, Blackbird Island and Crow Island; also Avery's Rock, the latter so named after a man who landed on it on July 18th, 1853, and to rescue whom ineffectual efforts were made. On our way to Goat Island is the office of the Reservation Commissioners.

GOAT ISLAND.

After crossing the second small bridge you are on Goat Island—a veritable temple of nature. There are about 80 acres in this and adjacent islands. It owes its name to the fact that, in 1779, John Stedman placed several goats on the island and neglected to care for them.

LUNA ISLAND.

The driver will follow the road to the right, and after a short ride through a beautiful piece of natural forest you will reach the stairway that leads to Luna Island. Stop a moment at its head and enjoy the beautiful view down the gorge. It is indeed a graceful sheet of water that you cross in passing from Goat Island to Luna Island. The fall between the two islands is called Centre Fall by some. On moonlight nights, the Lunar bow is best seen from this island and it is from this that it derives its name.

CAVE OF THE WINDS.

The next stopping place is the Cave of the Winds. The stairs leading to the slope below are free. But to enter the cave it is necessary that you secure the services of a guide and the protection of waterproof clothing. For this the charge is $1.00 for each person, and the trip is well worth the price. The guide leads you along safe walks and bridges into the midst of heavy

spray in front of the American Fall. Entering the cave you are behind the great sheet of falling water, which curtains the outer world from view. The roar of the water is fearful and unceasing. The spray dashes and whirls about you and you behold the most awe inspiring scene at Niagara. Its immensity is startling. The cave was formed by the action of the dashing water in washing away the soft substratum of the precipice, leaving the stratum of limestone over-head. After ascending the stairs drive to

TERRAPIN POINT.

An easy stairway and path leads to the very brink of the Horseshoe Falls, which is before you in all its magnificence. It will at once be seen that the water is deeper as it passes the brink at the centre, than at the American Fall. The beautiful green centre will force admiration, for the stream bends solidly over the precipice and does not burst into foam as it drops from the ledge. In 1833, a tower 45 feet high, 12 feet in diameter at its base, and eight feet at the top, was built here to increase the facilities for viewing the falls. It stood until 1873, when it was torn down, being considered unsafe. In the gorge below, the water is churned into a milky whiteness. The Horseshoe Fall is frequently referred to as the Canadian Fall. It extends from Goat Island to the shore of the Dominion of Canada. In 1842, its crest line measured 2,260 feet; in 1890 it was 3,010 feet. This fall shows a mean total recession of 104 51/100 feet in 48 years, the total area of recession being 275,400 superficial feet or 6 32/100 acres. In height the fall is 168 feet, the rapids above having a descent of 55 feet in three-quarters of a mile. The volume of water estimated to pass over the fall is 15,000,000 cubic feet per minute, or, about one cubic mile per week. Many geologists feel assured that the Horseshoe Fall is the engine that ploughed the great gorge. It certainly falls away more rapidly than the American Fall, as the soft stratum of rock below is undermined by the action of the water so that finally the weight of the heavy limestone top forces it to fall.

THREE SISTER ISLANDS.

In driving to these islands, which are a short distance above the brink of the Horseshoe Fall, a very fine view is obtained of the Canadian rapids, the water running at the rate of 28 miles an hour. The Sister Islands are three of the most delightful spots about Niagara. On all sides the river is of wondrous beauty and the many freaks of the course of the river are charming to a great degree. While standing far out on the Third Sister Island a fine view is obtained of the river and the cascade that extends to the Canadian shore, varying in height from 10 to 15 feet.

The drive around the head of Goat Island brings an entire change of scene. The river lies

before you calm and peaceful, and the contrast afforded between what you have a half-hour previously looked upon is wonderful. There is no intimation here of the wild pitching farther down stream and the river extends before you broad and smooth.

Crossing the bridge to the mainland the drive along the river to the upper part of the reservation will please you, the locality being rich in historical incident. You will catch a glimpse of Niagara's great manufacturing district on the world-famed tunnel power plant, which was built at a cost of several millions of dollars. This tunnel was started on October 4th, 1890; and in the summer of 1893 the first power was obtained. The first section of the tunnel completed is 7,000 feet long, 18.84 feet wide, 21,027 feet high, lined from end to end with brick, and has a power capacity of 100,000 horse power. An immense canal 1,200 feet long connects the river with the tunnel.

THE SUSPENSION BRIDGE.

After returning to the hotel for lunch, drive to and across the upper suspension bridge. The toll charge is 25 cents for each passenger and 25 cents for the carriage. A beautiful view of the falls is obtainable from the bridge. The structure was built to replace the one blown down by the big wind storm of January 9-10th, 1889. A portion of the old structure is hidden beneath the waters below. The present bridge is a monument to the bridge building ability of the present day. It was commenced on March 22nd, 1889, and finished on May 7th, of the same year. The length of the span between the centers of towers is 1,268 feet. The tower on the American side is 97 feet 6 inches in height, the one on the Canada is 103 feet 7 inches. The difference in height is owing to the variation in the height of the banks. The width of the structure is 17 feet 6 inches between the centers of chords. The weight of the bridge is 319 tons. It is suspended from four cables, each of which is 6½ inches in diameter and formed by seven wire ropes, whose diameter is 2¼ inches and in each of which there are 133 wires. Each of these seven ropes is capable of sustaining 155 tons, thereby making the sustaining power 28 times 155 tons. The deflection of the cable varies from 89 feet in winter to 92 feet in summer. The first bridge that was built on the site of the present structure was opened in January, 1869, and was built of wood. In 1872, the bottom chord was replaced by steel. In 1884, steel supplanted wood in the tower portion and the work was finished in 12 days. In October, 1887, the work of widening the bridge was commenced, and it was completed June 13th, 1888, without a suspension of traffic or any accident happening. The bridge that spans the gorge to-day is one of the prettiest, most graceful and substautial in the world.

QUEEN VICTORIA NIAGARA FALLS PARK.

Within a few minutes after leaving the bridge you enter Queen Victoria Niagara Falls Park.

This park, like the New York State Reservation, is free; James Wilson is superintendent Its creation followed an act passed by the Ontario Legislature in 1885, and on December 14th, 1886, an Order in Council was passed approving the selection of the lands for park purposes. The area of the park proper is 154 acres, but the Commissioners control the strip along the bank from Table Rock to Queenston known as the Chain Reserve. This gives them authority over more than 300 acres. The expense incurred in establishing this park by Canada was $436,813.24. The park was formerly opened on May 24th, 1888, the 69th anniversary of Queen Victoria's birthday. A grand civil and military display occurred on June 21st, 1888. It is from Victoria Park that the most beautiful front view of both falls can be obtained.

TABLE ROCK.

This is one of the historical spots in the park. At one time it was very famous, but it has gradually fallen away until little of the great ledge which once overhung the precipice remains. Some idea of what it once was is gained by the statement that in July, 1818, a mass 160 feet long by 40 feet wide fell, and on June 26th, 1850, a piece 200x260 went down. There is an elevator at this point, but the visitor of one day will find it best to forego the pleasure of the descent and drive on.

CEDAR AND DUFFERIN ISLANDS.

Notwithstanding that the possession is called Victoria Free Park, the Commissioners, at this writing, continue to charge a small toll to carriages entering upon the islands. But the view to be had driving through the islands is well worth the sum charged. From Cedar Island a magnificent view of the rapids above the falls is obtainable as they leap from ledge to ledge in the descent of 50 feet to the brink of the Horseshoe Fall. Pretty rustic bridges connect the Dufferin Islands, so named after Lord Dufferin, late Governor-General of Canada.

POWER DEVELOPMENT.

It is just a little above Table Rock that the Canadian Niagara Power Company will develop, by means of a short discharge tunnel and the necessary wheel-pits, about 250,00 horse power, which will serve for manufacturing purposes in the vicinity and also be transmitted electrically to outside points.

You have now visited the main portions of both of the great Free Parks at Niagara and, in the remaining few hours of your one day visit, will find it pleasant to hurry to some of the outside points of interest. The first of these is

FALLS VIEW.

At this point all the passenger trains of the great Michigan Central Railroad stop long enough to give their patrons a glimpse of one of the grandest and most sublime views at Niagara. This point of view is virtually a Michigan Central creation, and from it you can look far up the river before it plunges over precipice, and you have also before you every part of the falls, as well as a magnificent view of the gorge.

RAILWAY SUSPENSION BRIDGE.

Returning to the American side by way of the railway suspension bridge, you will get a good view of the railway suspension bridge and also of the great cantilever bridge. The railway suspension bridge was commenced in 1852 and finished in 1855. At first its construction was of wood, but it has been re-built and is now made of steel throughout. The carriage-way is 28 feet below the tracks. Foot and carriage passengers pay 10 cents toll each. The span from tower to tower is 825 feet. The track is 258 feet above the water. The weight of the superstructure is 800 tons. The diameter of each cable is 10¼ inches.

CANTILEVER BRIDGE.

The Cantilever Bridge is 300 feet up stream from the last mentioned structure. It was commenced April 15th, 1883, and finished December 1st, 1883. The total length of the bridge proper is 910 feet, which is divided into two cantilever arms, one of which is 375 feet in length, the other 395 feet. These cantilevers are supported on steel towers arising from the water's edge 130 feet high, and the total weight supposed to rest on these columns is 1,600 tons. A fixed span, 125 feet in length, connects the two cantilever arms in the center, making the span across the river from tower to tower about 500 feet. The shore ends of the cantilevers are held firm by immense stone abutments. The height of the bridge above the river is 245 feet. The structure is made of the best of steel throughout and is double tracked.

WHIRLPOOL RAPIDS.

While crossing the railway suspension bridge you will obtain a magnificent view of the whirlpool rapids, with the great whirlpool in the distance. From the dizzy height of the bridge it may be hard to realize that the white capped waters dash 40 to 50 feet high as they tumble and crush their way through this narrowest portion of the gorge, but such is the fact. The river is a grand one and never to be forgotten. Three elevators afford facilities for reaching the water's edge on the American side.

THE TRIP TO LEWISTON.

Leaving the bridge have your driver take you to the New York Central's Suspension Bridge Station. Dismiss him there and board the first Observation train for Lewiston. These trains are run about every hour by the New York Central. Tickets cost 25 cents for the round trip, and at no place at Niagara do you more fully get your money's worth. The trip is replete with interest throughout its entire length. Leaving the Falls Street Station, the train travels two miles along the gorge between the falls and the rapids, both of which delightful views are visible for almost the entire two miles. Leaving the lower station, the train gradually enters a deep cut through the rock, in which it travels for some distance, and then suddenly makes its exit from the cut, and the eyes of the passengers are allowed to feast upon one of the grandest views in the world.

The train is now wending its way slowly along the bank mid-way between the water's edge and the top of the high bank. On one side the rocky bluff is close by; on the other, the river is seen to turn in and out, as the water now smooth, now rough, hurries on to old Ontario.

Nothing at Niagara can compare with it for natural beauty. The thickly wooded Canadian bank has a charm beyond description. Across the gorge hang cables of the old bridge. Suddenly the train shoots into a short tunnel and when it emerges on the other side the scene is changed. The train has made the passage down the mountain, and the fields and woods of the lowlands are before you. For a moment or two you lose sight of the stream, but soon the train stops at the station right on the river bank, and you stand awe-struck at the beautiful, placid stream before you. It is hard to comprehend that this same water on which your eyes now rest was seen but a short time before in battle in the gorge, as though struggling for supremacy and leadership, in floating past the guns at Fort Niagara, to be lost in the waters of Ontario.

Do not leave the train at Lewiston, but return on it to the Niagara Falls station. If you have not tarried too long at the various points, you may still have an hour or two before your train leaves. If so, drive or walk to Prospect Park and there let the remaining moments of your stay at Niagara be passed in communing with the beauties of nature. If you have time, take another trip on the "Maid of the Mist." Then you will leave Niagara with your face washed by the spray and with over-flowing admiration for grand, old Niagara.

Two and Three Days at Niagara.

THE FIRST DAY.

Those who have two or three days to spend at the falls will far more appreciate the grandeur than those busy persons who do Niagara in the light of one day. When you leave your hotel after breakfast on the first day, stroll to Prospect Park. You have no use for a carriage. Give up the entire morning to viewing the places about the park and on the islands. The paths leading from one delightful spot to another are in plain sight, but, if any special information is wanted, the courteous care-takers, who are sufficiently numerous, will most willingly advance it. Each one is a well posted guide, and they have figures and facts at their tongue's ends. As you stroll from Prospect Park to and across Goat Island bridge to the islands, you will upon reaching the island, turn to the right and follow the path to the various points mentioned in the outline of the one trip.

Following a delightful morning stroll about the New York State Reservation and the enjoyment of lunch, strike out on foot again and go to Prospect Park and pass down the inclined railway and board the steamer "Maid of the Mist." Take the trip up and across the river and leave the boat at the Canadian dock. Walk up the hill, for you will find it pleasant to pause frequently and view the great cataract. Turn to your left at the top of the hill, enter Victoria Free Park and walk up to Table Rock. As you do this you will get many magnificent views.

An electric railway passes through Victoria Park and you will find it pleasant to board one of the cars and enjoy the ride. The road is 12 miles long and extends along a beautiful route from famous Chippewa to historic Queenston. On Queenston Heights a bloody battle was fought and there General Isaac Brock fell in 1813. A handsome freestone monument has been built to perpetuate his memory.

Returning from the ride on the Canadian electric railway and crossing to the American side by way of upper suspension bridge, take dinner. The remainder of the evening may be passed in resting from the fatigues of the day, or viewing the falls by night in Prospect Park, the gates of which remain open until 11 P. M. during the summer season.

THE SECOND DAY.

Before retiring for the night on your first day, leave word to be called in time for the first morning trip of the boat for Buffalo. The electric street cars carry you right to Schlosser Dock, where the boat will be found. On your way to the dock you pass the great power canal and

tunnel of the Niagara Falls Power Company. Schlosser Dock is a historic spot. At one time the spot was fortified and called Fort de Portage. It was burnt in 1759 by Joncaire. It was rebuilt in 1761 by Captain Schlosser of the British Army, who named it after himself. He died here. In 1837 the steamer Caroline was attacked here, set on fire and sent off the falls.

The steamer will carry you up the river past La Salle, Tonawanda and other villages, and you will experience much pleasure in viewing the beautiful island scenery. Grand Island, the largest in Niagara River, will afford you a pleasant study of its shores. Do not leave the boat at Buffalo. The trip down the river will be made on the opposite side of Grand Island to that on which you went up, and while stopping at Navy Island you will catch sight of the place that was the headquarters of the patriots in the war of 1837. The scenery on the upper Niagara is grand beyond description, and as you enter Buffalo harbor you look across the waters of Lake Erie.

Take a New York Central Observation Train early in the afternoon of the second day and go to Lewiston. There board the steamer in waiting and take a short voyage down the river to Niagara-on-the-Lake, a Canadian town full of history, it being said to be older than any village on the opposite bank. It was here that the first session of the Parliament of the upper Province was held, and in 1792 it was the home of the Lieutenant Governor of Canada.

Another steamer or a rowboat will aid you in crossing to the American side and visiting Fort Niagara, which was established as a trading post by La Salle in 1678, and which is now a United States Fort, fully garrisoned. In the early days it was the scene of several battles, and more than once it has been captured and re-captured. The boats and train will carry you to the falls, and on your second day's visit you will have seen the beauty of the Niagara from lake to lake.

THE THIRD DAY.

The third day may be most profitably passed in several ways. With many visitors a trip to Toronto is the favorite. If you decide to visit the charming Canadian city, the New York Central train will carry you to Lewistown, where you will board one of the staunch and handsome boats of the Niagara Navigation Company. You will have a delightful ride across Lake Ontario and have three or four hours in Toronto before taking the return boat, reaching the falls in the early evening. However, if you prefer passing the day in closer proximity to the falls, drive to the whirlpool rapids and whirlpool in the morning. Mention has been made of the rapids and the several elevators. At the elevators a charge of fifty cents is made for each person to go below, and the close view of the mighty rushing torrent that pours through the gorge is worth it.

THE WHIRLPOOL.

The whirlpool is a short distance below the rapids elevators, and of this wonder Porfessor Tyndall has written : "Here the river makes a sudden bend to the northeast forming nearly a right angle with its previous direction. The water strikes the concave bank with great force and scoops it incessantly away. A vast basin has been thus formed, in which the sweep of the river prolongs itself in gyratory currents. Bodies and trees, which have come over the falls, circulate here for days without finding an outlet. From various points of the cliffs above this is curiously hidden. The rush of the river into the whirlpool is obvious enough ; and though you imagine the outlet must be visible, if one existed, you cannot find it. Turning, however, round the bend of the precipice to the northeast, the outlet comes in view."

"I went down to the river's edge, where the weird loneliness and loveliness seemed to increase. The basin is enclosed by high and almost precipitous banks, covered—when I was there—with russet woods. A kind of mystery attaches itself to gyrating water, due, perhaps, to the fact that we are to some extent ignorant of the direction of its force. The water is of the brightest emerald green. The gorge through which it escapes is narrow and the motion of the water swift, though silent. The surface at the outlet is steeply inclined, but it is perfectly unbroken. There are no literal waves, no ripples with their bubbles to raise murmur, while the depth is here too great to allow the inequality of the bed to ruffle the surface, nothing can be more beautiful than this sloping mirror, formed by the Niagara in sliding from the whirlpool."

If you wish to leave Niagara in the full sense of enjoyment sf a delightful time, pass your last afternoon about the State Reservation You may think that you saw everything during the last visit there, but you will find many things that escaped your notice before. To linger about the near locality of the cataract and study the beauty of the framing will more thoroughly impress you with its sublimity. You may be tempted to make a second trip on the "Maid of the Mist." If you do this, you will depart from Niagara with regret that you cannot linger longer and view the ever changing beauty of the torrent.

NIAGARA IN WINTER.

In winter Niagara is strangely beautiful. The spray is frozen on the trees and shrubs and everything about appears as though cut from purest marble. Frequently the ice gathers in the gorge in such quantities that a a great ice bridge is formed and thousands of people cross from shore to shore over its uneven surface. An ice bridge formed on January 3rd, 1893, and lasted about two months and a half.

GEOLOGICAL.

There are few who see the Niagara gorge but that wonder what the facts are in regard to its formation. Geologists tell us, and their answer is accepted as conclusive, that it started at the mountain near Lewiston. The whole waters of the lakes there foamed over this dam, which was several miles in width. This accounts for the shells, etc., which have been found on Goat Island, it having been submerged; also for the shells found on the land along the river up stream. shells which enabled Lyell, Hall and others to prove that the Niagara once flowed through a shallow valley. That it cut the gorge is geologically equally decided. There is no better place to study geology and the strata of rocks than this gorge that Niagara has cut.

It is said that not only has Niagara cut the gorge; it has carried away the chips of its own workshop. The slate being probably crumed, is easily carried away. But at the base of the fall we find large boulders, which by some means or other, are gradually removed down the river. The ice which fills the gorge in winter and which grapples with the boulders has been regarded as the transporting agent. Probably it is to some extent. But erosion acts without ceasing on the outbutting points of the boulder, thus withdrawing their support and urging them down the river. Solution also does its portion of the work. That solid matter is carried down is proved by the difference of depth between the Niagara and Lake Ontario, where the river enters. The depth falls from seventy-two to twenty feet in consequence of the solid matter caused by the diminished motion of the river. Near the mouth of the gorge at Queenston, the depth, according to the Canadian Admiralty Chart, is 180 feet, while within the gorge it is 132 feet.

Prof. James Hall, in his geology of the 4th district of New York State, suggests the possibility of there having been three separate falls, one above the other, when the falls first began to recede. The face of the gorge from the falls at Lewiston and along the ridge shows us exactly through what kind of rocks the gorge was cut. Professor Hall gives these as the strata of the rocks; 1, Niagara limestone; 2, soft shale; 3, compact grey limestone; 4, shale; 5, sand-stone constituting, with Nos. 6, 7 and 8, the Medina group; 6, shale and marl; 7, quartz sandstone; 8, red sandstone.

Further facts and ideas are found in the writings of Prof. G. K. Gilbert, of the U. S. Geological Survey. He say that "one might suspect. after a hasty examination, the two sides had been left asunder by some Plutonic agency. But those who have made a study of the subject have reached the conclusion that the trench was excavated by running water, so that the strata of the two sides are alike because they are parts of continuous sheets, from each of which a narrow strip has here been cut. The contour of the cataract is subject to change. From time to time blocks of rock break away, falling into the pool below, and new shapes are then given

to the brink over which the water leaps. Many such falls of rock have taken place since the white man occupied the banks of the river, and the breaking away of a very large section is still a recent event. By such observations we are assured that the extent of the gorge is increasing at its end, that it is growing larger, and that the cataract is the cause of the extension.

This determination is the first element in the history of the river. A change is in progress before our eyes. The river's history, like human history, is being enacted, and from that which occurs we can draw inferences concerning what has occured and what will occur. We can look forward to the time when the gorge now traversing the fourth part of the width of the plateau will completely divide it, so that the Niagara will drain Lake Erie to the bottom. We can look back to the time when there was no gorge, but when the water flowed on the top of the plain to its edge, and the Falls were at Lewiston.

The commencement of the cutting of the Niagara gorge is the beginning of the history of the Niagara River. We have accomplished somewhat of our purpose if we have discovered that our river had a beginning. We are also accustomed to think of streams, and especially large streams, as permanent—as flowing on forever, so that the discovery of a definate beginning to the life of a great river like the Niagara is important and impressive. The author then considers the tendency of stream histories and the tendency of lake histories, and after citing the difference between the streams of the North and South says: At the South the whole drainage system is nature; At the North it is immature. At the South it is old; at the North young.

The explanation of this lies in a great geologic event of somewhat recent date - the event known as the age of ice. Previous to the ice age, our streams may have been as tame and orderly as those of the Southern States, and we have no evidence that they were lakes in this region. During the ice age, the region of the Great Lakes was somewhat in the condition of Greenland. It was covered by an immense sheet of ice, and the ice was in motion. In general it moved from North to South. Eventually the warm climate of the South prevailed over the invader born of a cold climate, compelling it to retreat. The ancient configuration of the country was more or less modified by the erosive action of the ice and the deposits of drift. An entirely new system of hills and valleys was given to the land. Thus it was that the whole water system of a vast region was refreshioned, and thus it has come to pass that the streams of this region are young. Like every other stream of the district of the Great Lakes, the Niagara was born during the melting of the ice."

Professor Gilbert then recites the different stages of the ice period and continuing says: "The next change in the geography of the lakes was a great one. The ice, which had previously occupied nearly the whole of the Ontario basin, so far withdrew as to enable accumuated water to flow out by way of the Mohawk Valley. The level of discharge was thus suddenly lowered 550 feet, and a large district previously submerged became dry land. Then for the

first time Lake Erie and Lake Ontario were separated, and then for the first time the Niagara River carried the surplus water of Lake Erie to Lake Ontario. Various changes contributed to modify the history of the Niagara River. In the beginning, when the cataract was at Lewiston, the margin of Lake Ontario instead of being twelve miles away as now, was only one or two miles distant, and the level of its water was about 75 feet higher than at present.

The characters of the gorge are in general remarkably uniform from end to end. Its width does not vary greatly; its course is flexed but slightly; its walls exhibit the same alteration of soft and hard rocks. But there is one exceptional point. Midway its course is abruptly turned at right angles. On the outside of the angle there is an enlargement of the gorge, and this enlargement contains a deep pool, called the Whirlpool.

At this point, and on this side only, the material of the wall has an exceptional character. At this point limestone, sandstone and shales disappear, and the whole wall is made of drift. Here is a place where the strata that forms the plateau are discontinuous, and must have been so before the last occupation of the region by the glazier, for the gap is filled by glacial drifts. If we consider as a geological period the entire time that has elapsed since the beginning of the age of ice, then the history of the Niagara River covers only a portion of the period. In the judgement of most students of glacial geology, and, I may add in my own judgement, it covers only a small portion of that period. The great life work of the river has been the digging of the gorge through which it runs from the cataract to Lewiston. The beginning of its life was the beginning of that task. The length of the gorge is in some sense a measure of the river's age. The problem of the time consumed in this great work has been attacked by numerous writers, and the resulting estimates have ranged from three to four thousand years to three or four million years.

A critical story of data lends to the belief that the rate of recession in the central part of Horseshoe Fall is approximately determined, and that it is somewhere between four feet and six feet per annum. There can be no question that the cataract is the efficient engine, but what kind of an engine is it? It is a matter of direct observation that from time to time large blocks of the upper limestone fall away into the river, and there seems no escape from the inference that this occurs because the erosion of the shale beneath deprives the limestone of its support.

At the margin of the Horseshoe Fall and at the American Fall in which places the body of falling water is much less, the process is different. There the fallen blocks of limestone form a low talus at the foot of the cliff, and upon them the force of the desending water is broken and spent. The differences between the two processes is of great importance in the present connection, because the two rates of erosion are very different.

It is a problem of nature, and like other natural problems demands the practical gathering of many facts. of facts of many kinds, of categories of facts suggested by the tentative theories of to-day, and of new categories of facts to be suggested by new theories.

The river sprang from a great geologic revolution, the banishment of the dynasty of cold, and so its lifetime is a geologic epoch ; but from first to last man has been the witness of its toil, and so its history is interwoven with the history of man. The human comrade of the river's youth was not, alas, a reporter with a note-book, else our present labor would be light.—

Whatever the antiquity of the great cataract may be found to be, the antiquity of man is greater.

THE NIAGARA RIVER.

The Niagara River is part of the boundary line between the United States and Canada, so decreed by the treaty of Ghent in 1815. By that treaty, the boundary line runs through the center of the Great Lakes, and through the deepest channel af the rivers. By this means, over three-fourths of the islands in the River, including all the important ones, but one, belong to the United States. Of these islands there are in all 36, of which Grand Island is the largest and Goat Island the most famous. In its course the river falls 336 feet, as follows : From Lake Erie to the Rapids above the Falls, 15 feet ; in the Rapids, 55 feet ; at the Falls, 161 feet ; from Falls to Lewiston, 98 feet ; from Lewiston to Lake Ontario, 7 teet. Its sources are. Laks Superior, the largest body of fresh water in the world.

Lake Superior,	335	miles long,	160	miles wide,	1030	feet deep.
" Huron,	260	"	100	"	1000	"
" Michigan,	320	"	70	"	1000	"
" St. Clair,	49	"	15	"	20	"
" Erie,	290	"	65	"	84	"

The Falls are in latitude 43° 6″ North ; longitude 2° 5″ West from Washington, or 79° 5″ West from Greenwich.

Hennepin speaks of three Falls, the third formed by the huge masses of rock situated where Table Rock stood. These rocks were of great extent, and the water being obliged to flow around them, formed the third Fall, and this Fall fell inward at right angles to the present Fall. Seventy years later, 1751, this third Fall had disappeared, though still told about by the Indians. The reason was that the big rock had been crumbled away, and the channel of the big or center Fall, had been cut deeper, thus draining this higher channel.

CITY OF NIAGARA FALLS.

The City of Niagara Falls received its charter on March 17, 1892, and is a consolidation of the former villages of Niagara Falls and Suspension Bridge. Its present population is about 20,000, but a large increase will undoubtedly result from the power development now completed and which is attracting world-wide attention.

NIAGARA'S IMMENSE POWER.

No feature at Niagara is attracting quite so much attention to-day as the big water power tunnel. It is 7,000 feet long, 21 feet high and 19 feet wide. It runs 200 feet beneath the town and will aid in developing 100,000 horse power. It has its outlet below the suspension bridge and is lined with brick throughout its entire length. The water that will furnish power and flow through the great tunnel will be taken from the upper river over a mile back from the brink of the falls. A canal 1,200 feet long is the connecting link between river and tunnel, and the water will plunge down penstocks on to turbines, the greatest ever operated in the United States. Already the manufacturers who desire to avail themselves of this wonderfully cheap and accessable power are beginning to locate at the Falls, and the city that was at one time simply a summer resort has started out to attain wonderful greatness as the largest manufacturing city of America. The men at the head of this great project are Edward D. Adams, Francis Lynde Stetson, Edward A. Wickes and William B. Rankine of New York.

HOTELS.

The hotel interests at Niagara Falls are very large, and no matter what a person's likes may be, they can be easily accommodated. The prices per day vary with the season. The large and leading hotels of the city are :

THE CATARACT HOUSE.

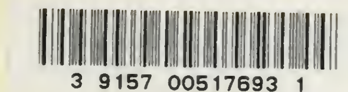
PROSPECT HOUSE.

HOTEL KALTENBACH.

THE INTERNATIONAL.

THE IMPERIAL.

Besides these there are numerous others, many of which would please the most fastidious. Among these may be mentioned Salt's New Hotel, the Temperance House, the Columbia, the Niagara House (Main Street), the Hotel Porter, Niagara Falls House, the Falls Hotel, Harvey House, Central House, Hotel Mayle, Hotel Atlantique, Ziegler's Hotel, Fuchs' Hotel, Schwartz's Hotel, Monument House, Observation Tower Hotel, Windsor House, Colonnade, Cosmopoitan, United States Hotel (Main Street), Western Hotel, New York Central House, Dolphin House, Exchange Hotel, Union House, Lester House, Frontier House, Europeau Hotel.


3 9157 00517693 1


SURGITE